

## **EPCRA Section 313 Toxic Release Inventory Reporting Naval Base Ventura County Point Mugu Reporting Year 2020**

### **1.0 PURPOSE**

This document summarizes the results of Toxic Release Inventory (TRI) compliance reporting efforts for Naval Base Ventura County (NBVC) Point Mugu for Reporting Year (RY) 2020. Annual TRI reporting is governed by regulations established under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA Section 313), as interpreted by the United States (U.S.) Department of Defense (DoD) and Department of the Navy (Navy) policy and guidance. This document was prepared by Multi-Media Environmental Compliance Group (MMEC Group) under Contract Number N62470-16-D-2405, Delivery Order N6247318F4764.

### **2.0 LOCATION**

NBVC Point Mugu is a naval air station on the California coast, approximately 50 miles northwest of Los Angeles. The base lies southwest of the Santa Monica Mountains, immediately southwest of Highway 1. Bounded on the south and southwest by the Pacific Ocean, NBVC Point Mugu lies approximately 5 miles southeast of Naval Construction Battalion Center (NCBC) Port Hueneme.

### **3.0 MISSION**

NBVC's mission is to provide integrated shore services to support the diverse needs of the Fleet, Fighter and Family in Ventura County.

### **4.0 PRIMARY ORGANIZATIONS/ACTIVITIES LOCATED AT THE FACILITY**

The following key organizations and activities are located at NBVC Point Mugu:

- Naval Air Warfare Center Weapons Division (NAWCWD)
- Naval Satellite Operations Center
- Commander, Airborne Command Control and Logistics Wings 115, 116, and 117
- Fleet Logistics Support Squadron 55
- Air Test and Evaluation Squadron 30
- Fleet Readiness Center (FRC)
- Coast Guard Air Station San Francisco

NBVC Point Mugu consists of a diverse work force of military, civilian, and contract personnel who provide facilities engineering, maintenance, utilities, and transportation support. NBVC Point Mugu also provides supply, administrative, and military community programs, explosive ordnance handling, storage, and disposal service, and security services, both physical and informational.

NBVC Point Mugu's runways are capable of handling any aircraft and are used for military logistical support. NBVC Point Mugu is home to several air squadrons, including three E-2 Hawkeye squadrons. NBVC Point Mugu is also used as a base for air-to-air combat training.

NBVC Point Mugu operates and maintains air station facilities and provides support services for the NAWCWD and assigned tenants and activities. These services include air terminal operations, air traffic control, and firefighting and crash crews.

NBVC Point Mugu is on the eastern edge of the 36,000-square-mile fully instrumented and integrated Mobile Sea Range area used for the testing and evaluation of weapons and aircraft systems. The Range Complex comprises the following major range areas:

- Sea Test Range, including NAWCWD's missile launchers and other infrastructure identified directly with missile launches
- San Nicolas Island including Naval Outlying Landing Field (part of the Mobile Sea Range Complex)

NBVC Point Mugu also has two rifle ranges known as the Seabee Rifle Range at the eastern edge of the installation and the Small Bore Range operated by NBVC Force Protection.

## 5.0 RECENT TRI REPORTING HISTORY

TRI Form R reports have been submitted for the following chemicals in recent years:

- Ethylbenzene (RY2006–RY2016)
- Lead (RY2006–RY2019)
- Naphthalene (RY2006–RY2012, RY2016–RY2019)
- Nitrate Compounds (RY2006–RY2019)
- Ethylene Glycol (RY2008 and RY2011)

## 6.0 HAZARDOUS MATERIAL AND TRI CHEMICAL DATA

TRI requires submittal of a U.S. Environmental Protection Agency (USEPA) Form R for any listed chemical at a quantity exceeding any one of the following thresholds:

- 25,000 pounds (lb) per year for chemicals manufactured onsite
- 25,000 lb per year for chemicals processed onsite
- 10,000 lb per year for chemicals otherwise used onsite
- 100 lb per year for per- and polyfluoroalkyl substances (PFAS)
- Chemical-specific thresholds for persistent bioaccumulative toxic (PBT) chemicals<sup>1</sup>
  - 0.1 gram per year for dioxin and dioxin-like compounds
  - 10 lb per year for benzo[g,h,i]perylene, chlordane, heptachlor, hexachlorobenzene, isodrin, mercury, mercury compounds, octachlorostyrene, pentachlorobenzene, polychlorinated biphenyls (PCBs), and toxaphene
  - 100 lb per year for aldrin, lead, lead compounds, methoxychlor, pendimethalin, polycyclic aromatic compounds (PACs), tetrabromobisphenyl A, and trifluralin

Section 7321 of the National Defense Authorization Act (NDAA) for fiscal year 2020 (P.L.116-92) added 172 individual PFAS chemicals to the TRI list of chemicals with an effective date of January 1, 2020. RY2020 Form R reporting is required for any of these PFAS chemicals individually manufactured, processed, or otherwise used in quantities exceeding 100-lb-per-year. The NBVC Point Mugu TRI threshold evaluation for these chemicals is presented in Section 6.4.

Per USEPA instruction, the manufactured, processed, and otherwise used threshold evaluations are performed independently. For example, the amount of an individual TRI chemical manufactured is not counted toward the amount processed or the amount otherwise used.

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<sup>1</sup> USEPA TRI instructions indicate that PBT chemical quantities are to be reported to the nearest tenth of a pound, rather than the nearest pound for all non-PBT TRI chemicals. This convention is followed throughout this report.

However, if a TRI chemical quantity surpasses any of the established thresholds, then the resulting Form R must address releases and offsite transfers resulting from all non-exempt manufactured, processed, and otherwise used activities.

## 6.1 General Hazardous Material Use

### 6.1.1 Hazardous Material Minimization Center

Data regarding 2020 TRI chemical quantities issued to NBVC Point Mugu organizations and tenants through the Hazardous Material Minimization (HAZMIN) Center were obtained from the Enterprise Resource Planning (ERP) database by Charles Roiz of Naval Supply Fleet Logistics Center (NAVSUP FLC). Table 1 presents these data.

ERP is a data management system implemented by NAVSUP FLC in 2012. It tracks HAZMIN Center issuance of hazardous materials to individual organizations. Information captured includes date of issue, number of containers issued, and total issue weight. Chemicals in each hazardous material issue are tracked using Safety Data Sheet (SDS) information maintained within ERP. Quantities of individual chemicals issued to NBVC Point Mugu work centers and shops can be determined for the calendar year with the ERP Usage Report (ZRMIM0010). When more detail is required to track a specific chemical, the ERP Transaction History Report (ZRMMD0006) can be used to identify the shops using the chemical and the specific hazardous materials that contain the chemical.

**Table 1. NBVC Point Mugu TRI Chemical Quantities in Hazardous Materials Issued from the HAZMIN Center in 2020**

TRI Chemical	2020 Total Chemical Issued (lb)
1,2,4-trimethylbenzene	11
Aluminum (fume or dust)	14
Barium compounds	27
N-Butanol	7
Copper	1
Dibutylphthalate	---
Diphenylamine	451
Ethylbenzene	21
Ethylene glycol	5,656
Glycol ethers	140
Lead	27.1
Lead compounds	19.4
Manganese compounds	223
Phenol	54
Sulfuric acid	1
Toluene	265
Xylene	56
Zinc compounds	149

lb = pound(s); TRI = toxic release inventory

Only “301” and “501” transactions from the HAZMIN Center were extracted from the ERP Usage Report. These transactions represent hazardous material issues from the HAZMIN Center to the work centers (301 “bin issues”) and direct issues to the work centers that do not physically pass through the HAZMIN Center (501 “issues”). Scrapped items (“551”) and bin-to-bin transfers (“309”) were not extracted from the ERP Usage Report, because that would constitute double counting, according to NAVSUP FLC personnel.

Also note that the totals in Table 1 for lead, lead compounds, and sulfuric acid do not include the quantities in batteries. These chemicals are in lead-acid batteries, which are commonly used at NBVC Point Mugu in motor vehicles and are covered under the TRI motor vehicle maintenance exemption and/or the article exemption.

### 6.1.2 Other Hazardous Material Use

Ethylene glycol in arresting gear on the airfield flight lines is an important, non-exempt TRI chemical use that must be closely monitored for TRI reporting purposes. There are four sets of arresting gear at NBVC Point Mugu. Each set consists of two dampening fluid chambers on opposite sides of the runway, an arresting wire, and two internal combustion engines to reel in the arresting wire after use. The dampening fluid chambers each hold approximately 300 gallons (gal) of an ethylene glycol and water solution, which absorbs the force from the arresting wire during “tail hook” landings. ERP data indicate that 605 gal of arresting gear hydraulic fluid were issued to Air Operations (Air Ops) in 2020 containing 5,529 lb of ethylene glycol (accounted for in Table 1). According to NBVC Point Mugu personnel, there were no complete change-outs of dampening fluid from any of the four sets of arresting gear in 2020. Also, 330 gal of dampening fluid (60/40 glycol/water mix) were added to the units in 2020 to top off fluid levels, which would be accounted for in Table 1.<sup>2</sup>

Full change-outs of the dampening fluid in the arresting gear units typically occur approximately every 15 years and were most recently performed in 2008 at NBVC Point Mugu. According to NBVC Point Mugu personnel, the units are not due to be changed out until 2023, depending on testing.

In addition, an antifreeze recycling unit is in use by FRC at Building 311. Antifreeze recycling is not considered motor vehicle maintenance and cannot be exempted from the TRI threshold evaluation. Because this antifreeze is considered distributed in commerce, TRI chemical quantities contained in the recycled mixture (ethylene glycol) must be applied toward the TRI processed threshold. According to the FRC Environmental Coordinator, RS2 Perrine, approximately 130 gal of antifreeze (50/50 mix with water) were recycled in 2020. The amount of ethylene glycol in the recycled antifreeze is calculated as follows:

- 130 gal antifreeze x 0.5 lb ethylene glycol/lb antifreeze x 9.2 lb /gal = 598 lb ethylene glycol processed

The SDS for Prestone antifreeze was used to determine the density and chemical content of ethylene glycol.

Additionally, substantial quantities of sodium chlorite and calcium nitrate are used to control odors from a lift station prior to discharge of NBVC Point Mugu sewage to the local sewer district. Sodium chlorite is not a TRI chemical, but calcium nitrate is a TRI nitrate compound. Trioxyn<sup>®</sup> contains calcium nitrate at a concentration of 60 percent (%). The use of this product is

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<sup>2</sup> Data from Mr. Beckles, NBVC Air Terminal, provided to Natalie Baum, MMEC Group, June 17, 2021.

not tracked by the HAZMIN Center. Data from 2020 show that 511,544 lb of Trioxyn® were used, which yields 306,926 lb of otherwise used nitrate compounds.<sup>3</sup>

## 6.2 Fuels

The following fuels are used at NBVC Point Mugu:

- Gasoline
- Jet fuel
- Diesel fuel
- Natural gas

Liquid fuels are delivered by truck from the Defense Fuel Support Point (DFSP) San Pedro to various storage tanks throughout the installation. The NBVC Point Mugu Fuel Farm is the main storage and distribution facility for jet fuel. A number of fueling stations throughout the facility are used by Navy, other DoD organizations, and contractors providing services to NBVC Point Mugu operations and personnel.

Most of the fuel used at NBVC Point Mugu is covered under the TRI motor vehicle maintenance exemption (e.g., fueling of facility-based aircraft, automobiles, and trucks). Fuel dispensed from the Navy Exchange (NEX) gasoline station is covered under the TRI personal use exemption, as is natural gas used to heat buildings.<sup>4</sup>

The remainder of Section 6.2 addresses NC Point Mugu fuel use not covered under a TRI reporting exemption.

### 6.2.1 Gasoline

Gasoline is dispensed at the government fueling station. This fuel is for use by government-owned vehicles only (no private or transient ground vehicles). These vehicles are under the operational control of NBVC Point Mugu and are covered under the TRI motor vehicle maintenance exemption.

Non-exempt gasoline use at NBVC Point Mugu is limited to transient vehicles and non-motor-vehicle use. Vehicles from the neighboring Channel Islands Air National Guard (CIANG) come to NBVC Point Mugu to purchase gasoline. These vehicles are considered transient because they are present on NBVC Point Mugu only to purchase fuel. The CIANG is a DoD entity, and therefore the fueling of its vehicles is considered an otherwise used activity. The issue of gasoline to CIANG vehicles is identified by the code FP 6043 in the fuels data; in 2020, the amount of gasoline issued to these vehicles totaled 9,675 gal.<sup>5</sup>

In 2020, the amount of gasoline otherwise used in non-motor vehicles at NBVC Point Mugu, such as non-self-propelled ground support equipment (GSE), generators, and arresting gear engines on the runway, was 312 gallons (gal).<sup>6</sup> Therefore, an estimated total of 9,987 gal of non-exempt gasoline were used at NBVC Point Mugu in 2020. This information was combined with typical gasoline chemical composition data to yield the following TRI chemical use data:

- 3% ethylbenzene x 9,987 gal x 6.26 lb/gal = 1,876 lb
- 2.5% benzene x 9,987 gal x 6.26 lb/gal = 1,563 lb

<sup>3</sup> 2020 NBVC Point Mugu, Building 64 Chemical Treatment Product Use & Discharge Summary provided by Clark Roberts of Consolidated Water Technologies Inc., June 10, 2021.

<sup>4</sup> *How to Consider Fuel Thresholds Under EPCRA Section 313*, June 2010, p 5. This is an addendum to the Navy's *Getting Started with The Emergency Planning and Community Right-to-Know Act (EPCRA) – A Basic Guidance Document for Navy Facilities*, May 2009.

<sup>5</sup> NBVC Fuel Receipts provided by Robert Thompson, Fuels Accountant NAVSUP FLC Fuels, to MMEC Group, June 14, 2021.

<sup>6</sup> Data provided by Greg Vance, NBVC PWD Environmental Air Program, June 4, 2021, and fuel receipts from NAVSUP FLC Fuel Division.

- 3% n-hexane x 9,987 gal x 6.26 lb/gal = 1,876 lb
- 1% naphthalene x 9,987 gal x 6.26 lb/gal = 625 lb
- 3% 1,2,4-trimethylbenzene x 9,987 gal x 6.26 lb/gal = 1,876 lb
- 7.5% toluene x 9,987 gal x 6.26 lb/gal = 4,689 lb
- 7.5% xylene x 9,987 gal x 6.26 lb/gal = 4,689 lb

### 6.2.2 Jet Fuel

Jet fuel is received from DFSP San Pedro and is stored in aboveground storage tanks at the NAVSUP FLC Fuels Division. Most of the fuel is pumped into ground refueling vehicles at the Truck Loading Station for transfer to aircraft and the Jet Engine Test Stands (JETSS) at NBVC Point Mugu. Some of the fuel is pumped directly to hot pit refueling areas and then into aircraft. In 2020, 3,828,126 gal of jet propellant A (JAA) and 140,922 gal of jet propellant (JP)-5 were distributed.

JAA and JP-5 contain TRI chemicals; however, most jet fuel use is exempt at NBVC Point Mugu under the TRI motor vehicle maintenance exemption. As discussed later in this section, jet fuel use in non-motor-vehicle equipment and transient aircraft is not covered by the motor vehicle maintenance exemption and must be accounted for as otherwise used in the TRI threshold evaluation. Additionally, quantities provided to United States Coast Guard (USCG) and Federal Bureau of Investigation (FBI) operations at NBVC Point Mugu must be accounted for as processed, because these organizations are non-DoD entities.

The following are the only non-exempt uses of jet fuel at NBVC Point Mugu:

- JAA provided to transient aircraft (otherwise used)
- JAA in non-motor-vehicle equipment (otherwise used)
- JAA in JETSS (otherwise used)
- JAA issued to the FBI (processed)
- JAA issued to the USCG (processed)
- JP-5 in transient aircraft (otherwise used)
- JP-5 in non-motor-vehicle equipment (otherwise used)

### Jet Fuel in Transient Aircraft

Transient aircraft at NBVC Point Mugu are fueled by the NAVSUP FLC Fuels Division, as are all aircraft at the installation. No distinction is made between aircraft arriving at NBVC Point Mugu for mission-oriented purposes (e.g., NBVC Point Mugu-based aircraft such as those in the VX-30 squadron, airlifts delivering personnel and equipment, and aircraft onsite for training) and those arriving for refueling purposes only. Fueling of aircraft for mission-oriented purposes is covered under the TRI motor vehicle maintenance exemption in accordance with Navy TRI guidance.<sup>7</sup> However, fuel provided to aircraft that are at NBVC Point Mugu solely for refueling purposes (i.e., “gas-and-go”) is not exempt from TRI reporting.

Based on data provided by the NAVSUP FLC Fuels Division, NBVC Point Mugu distributed 189,821 gal of JAA and 14,134 gal of JP-5 to transient aircraft in 2020. To estimate these quantities, aircraft under the station’s operational control were differentiated from transient

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<sup>7</sup> *How to Consider Fuel Thresholds under EPCRA Section 313*, June 2010, page 5. This is an addendum to the Navy's *Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA) – A Basic Guidance Document for Navy Facilities*, May 2009.

aircraft by reviewing fueling records. The fueling records were filtered by “Tail #” and the number of issuances to each particular aircraft was noted. If an aircraft received many issuances in the year, it was assumed that the aircraft was under the operational control of NBVC Point Mugu. If the aircraft received only a single fuel issue, it was assumed to be transient.

If the aircraft received more than one, but not many, fuel issues, the issue times and dates were analyzed. If all of the issues were within an hour or so of one another, the aircraft was assumed to be a transient aircraft that required more than one tanker to fill it. If the issues to an aircraft were widely spaced throughout the year, it was assumed to be a transient aircraft that visited more than once. If the issuances all occurred within a few days of one another, but were more than an hour apart, the aircraft was assumed to be a visiting aircraft under the operational control of NBVC Point Mugu (e.g., for training).

### **Jet Fuel in Non-motor Vehicles**

Jet fuel is used in NBVC Point Mugu GSE such as air compressors, mobile air conditioners, aircraft start carts, and hydraulic units. Jet fuel use in these types of equipment is not exempt from TRI reporting because these items do not qualify as motor vehicles. In 2020, 635 gal of JAA and 0 gal of JP-5 were used in this equipment.<sup>8</sup>

### **JAA Use in JETs**

Two JETs at NBVC Point Mugu use JAA: one at the FRC at Building 689 and the other operated by the Target Division in Building 333. In 2020, 14,513 gal of JAA were used in the JETs.<sup>9</sup>

### **JAA Issued to the USCG and FBI**

Fueling of non-DoD aircraft is not exempt from TRI reporting under the motor vehicle maintenance exemption, according to Navy TRI guidance.<sup>10</sup> TRI chemicals in fuel provided to these aircraft are counted toward the processed chemical threshold, rather than the otherwise used chemical threshold when considering fuel provided to transient aircraft and non-motor vehicles. According to NAVSUP FLC Fuels Division records, aircraft owned by the USCG and FBI at NBVC Point Mugu were issued a total of 29,608 gal of JAA in 2020. This amount must be accounted for under the TRI processed chemical threshold.

### **Summary of Non-exempt JAA**

The following is a summary of the non-exempt JAA use at NBVC Point Mugu:

- Transient aircraft = 189,821 gal (otherwise used)
- Non-motor vehicles = 635 gal (otherwise used)
- JETs = 14,513 gal (otherwise used)
- USCG and FBI = 29,608 gal (processed)
- Total non-exempt JAA otherwise used = 204,969 gal
- Total non-exempt JAA processed = 29,608 gal

The 2020 jet fuel suppliers for NBVC Point Mugu were identified through email correspondence with Jennifer Bertone, Supply Planner for the Defense Logistics Agency (DLA), Energy

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<sup>8</sup> Data provided by Greg Vance, NBVC PWD Environmental Air Program, May 27, 2021.

<sup>9</sup> Data provided by Greg Vance, NBVC PWD Environmental Air Program, May 27, 2021.

<sup>10</sup> *How to Consider Fuel Thresholds under EPCRA Section 313*, June 2010, page 5, “Non-DoD Fuel Distribution.” This is an addendum to the Navy’s *Getting Started with the Emergency Planning and Community Right-to-Know Act (EPCRA) – A Primer for Navy Facilities*, May 2009.

Americas West. According to this DLA source, most of the JAA supplied to NBVC Point Mugu in calendar year 2020 originated from the Tesoro refinery located in Wilmington, California (CA), and the JP-5 originated from the Valero Benicia Refinery located near San Francisco, CA.<sup>11</sup>

The Tesoro SDS addressing JAA indicates ranges of chemical constituents for a wide variety of the company's jet fuels, including JAA, JP-8, and Aviation Fuel. The SDS chemical composition data show only naphthalene (0–3%), and ethylbenzene (0–1%) in JAA at concentrations above their TRI de minimis concentration levels. These ranges straddle the TRI de minimis level of 0.1% for both chemicals. To calculate the amounts of both chemicals in the JAA, TRI guidance provided by USEPA is used to yield the following results:<sup>12</sup>

- $204,969 \text{ gal} \times 6.672 \text{ lb JAA/gal} = 1,367,553 \text{ lb JAA}$
- $1,367,553 \text{ lb JAA} \times [(0.030 - 0.001) / (0.030 - 0.000)] \times [(0.030 + 0.001) / 2] = 20,491 \text{ lb naphthalene}$
- $1,367,553 \text{ lb JAA} \times [(0.010 - 0.001) / (0.010 - 0.000)] \times [(0.010 + 0.001) / 2] = 6,769 \text{ lb ethylbenzene}$

Applying these percentages to the 29,608 gal of processed non-exempt JAA provided to USCG/FBI aircraft at NBVC Point Mugu yields the following results:

- $29,608 \text{ gal} \times 6.672 \text{ lb JAA/gal} = 197,545 \text{ lb JAA}$
- $197,545 \text{ lb JAA} \times [(0.030 - 0.001) / (0.030 - 0.000)] \times [(0.030 + 0.001) / 2] = 2,960 \text{ lb naphthalene}$
- $197,545 \text{ lb JAA} \times [(0.010 - 0.001) / (0.010 - 0.000)] \times [(0.010 + 0.001) / 2] = 978 \text{ lb ethylbenzene}$

### Summary of Non-exempt JP-5 Usage

The following is a summary of the non-exempt JP-5 use at NBVC Point Mugu:

- Transient aircraft = 14,134 gal (otherwise used)
- Non-motor vehicles = 0 gal (otherwise used)
- USCG and FBI = 0 gal (processed)

The Valero SDS for jet fuels indicates only ranges of chemical constituents for a wide variety of different jet fuels (e.g., Jet-A, JP-8, and Jet Fuel Stock), including JP-5. April Twu (Environmental Engineer, Valero Refining Company – CA, Benicia Refinery) was contacted for more precise information on TRI chemicals in the JP-5 supplied to NBVC Point Mugu. She provided the following JP-5 composition data that Valero uses for TRI calculations at the refinery:<sup>13</sup>

- Naphthalene at 0.37%
- Ethylbenzene at 0.075% (less than de minimis limit of 0.1% for this chemical)
- Benzene at 0.005% (less than de minimis limit of 0.1% for this chemical)<sup>14</sup>
- Xylene at 0.48% (less than de minimis limit of 1% for this chemical)
- Toluene at 0.06% (less than de minimis limit of 1% for this chemical)

<sup>11</sup> Email dialog with Jenifer Bertone, jennifer.bertone@dla.mil, and Natalie Baum of MMEC Group, March 10, 2021.

<sup>12</sup> *Toxic Chemical Release Inventory Reporting Forms and Instructions, Revised 2020 Version*, EPA 740-B-21-001, March 2021, page 26.

<sup>13</sup> Email dialog between April Twu of Valero and Natalie Baum of MMEC Group, March 30, 2021.

<sup>14</sup> Based upon the updated JP-5 composition data received from Valero, ethylbenzene and benzene concentrations fall below de minimis levels; therefore, the amounts of these chemicals in JP-5 were not factored in the threshold determination.

- 1,2,4-Trimethylbenzene at 0.57% (less than de minimis limit of 1% for this chemical)
- Cyclohexane at 0.08% (less than de minimis limit of 1% for this chemical)

Applying these percentages to the 14,134 gal of otherwise used, non-exempt JP-5 at NBVC Point Mugu yields the following estimates:

- $14,134 \text{ gal} \times 0.815 \times 8.34 \text{ lb/gal} \times 0.0037 = 355 \text{ lb naphthalene}$

Applying these percentages to the 0 gal of processed non-exempt JP-5 at NBVC Point Mugu yields the following estimates:

- $0 \text{ gal} \times 0.815 \times 8.34 \text{ lb/gal} \times 0.0037 = 0 \text{ lb naphthalene}$

Please note that 0.815 is the specific gravity of JP-5.

### 6.2.3 Diesel Fuel

Diesel fuel is used in many operations at NBVC Point Mugu, including emergency generators, GSE, and motor vehicles. Diesel fuel use in motor vehicles is exempt from TRI reporting under the motor vehicle maintenance exemption, except for transient vehicles at NBVC Point Mugu. CIANG is a DoD entity and therefore the fueling of its vehicles is considered an otherwise used activity. Also, any fuel used to directly support processes (e.g., heating a paint booth to cure paints) would not be exempt from reporting.

Based on the data provided by the FLC Fuels Division and Air Program, the following non-exempt quantities of diesel fuel were used in 2020:

- CIANG transient vehicles = 16,597 gal
- Non-mobile GSE = 9,124 gal
- Emergency generators = 34,070 gal

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Total = 59,791 gal

An analysis of SDSs from seven major diesel fuel suppliers shows naphthalene and ethylbenzene in diesel fuel at various amounts above de minimis limits. Using the median concentration result for naphthalene and ethylbenzene, the TRI chemical composition of diesel fuel is assumed to be 0.5% naphthalene and 0% ethylbenzene. The amount of naphthalene used in non-exempt diesel equipment was calculated to be 2,182 lb based on a density of 7.3 lb per gal and 0.5%.

### 6.2.4 Fuel Summary

A summary of non-exempt TRI chemical use in fuels at NBVC Point Mugu is as follows:

- Ethylbenzene (otherwise used) =  $1,876 + 6,769 = 8,645 \text{ lb}$
- Ethylbenzene (processed) = 978 lb
- Benzene = 1,563 lb
- N-Hexane = 1,876 lb
- Naphthalene (otherwise used) =  $625 + 355 + 20,491 + 2,182 = 23,653 \text{ lb}$
- Naphthalene (processed) =  $2,960 + 0 = 2,960 \text{ lb}$
- 1,2,4-Trimethylbenzene = 1,876 lb
- Toluene = 4,689 lb
- Xylene = 4,689 lb

### 6.3 NBVC Point Mugu Munitions Use

Munitions use at the Seabee Rifle Range and Small Bore Range at NBVC Point Mugu is tracked by munitions type (e.g., 5.56-millimeter [mm] cartridges, 12-gauge shotgun, and 9-mm ball). Missiles are also launched from NBVC Point Mugu to an impact site at San Nicolas Island, and are tracked by the Range Sustainment Office. These missiles are inert and contain no ordnance.

Annual munitions usage data were obtained by NBVC Point Mugu Environmental Program Office personnel and compiled for TRI chemical content based on information from DoD's Toxics Release Inventory Data Delivery System (TRI-DDS).<sup>15,16</sup> In 2020, a total of 296,532 rounds were fired, which is a 15% increase from the 258,707 rounds fired in 2019. RY2020 NBVC Point Mugu TRI-DDS chemical usage results are as follows:

- Aluminum (fume or dust) – 1 lb
- Antimony – 44 lb
- Antimony compounds – 2 lb
- Barium compounds – 5 lb
- Copper – 702 lb
- Dibutyl phthalate – 31 lb
- Diphenylamine – 8 lb
- Lead – 2,341.8 lb
- Lead compounds (PBT) – 6.2 lb otherwise used, 2 lb manufactured
- Nitroglycerin – 75 lb

### 6.4 PFAS Used in Fire Suppression

For RY2020, 172 PFAS chemicals were added to the list of TRI chemicals that must be considered in the TRI threshold evaluation. PFAS chemicals have been a critical ingredient in aqueous film-forming foam (AFFF) used for fighting petroleum fires at airfields, aboard ships, and in industrial processes; however, the use of these chemicals is being phased out and restricted. AFFF is kept on hand at multiple locations, such as aircraft hangars and fire trucks, throughout NBVC Point Mugu for use in emergency fire suppression. These locations are listed in Table 2.

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<sup>15</sup> David Brown, David.brown.ca@navy.mil provided Small Bore Range data, March 9, 2021. GM1 James Carter, NCG-1, james.w.carter1@navy.mil provided the Seabee rifle range data, March 8, 2021, via Keith Citoria of NBVC.

<sup>16</sup> Note that data for missiles fired from NBVC Point Mugu to San Nicholas Island have not been obtained as of the date of preparation of this document.

**Table 2. NBVC Point Mugu AFFF Inventory**

Facility/Building	Tank Type	Volume (gallons)
Hangar 372	Bladder Tank 1	1,100
Hangar 372	Bladder Tank 2	1,100
Hangar 365	Bladder Tank 1	250
Hangar 365	Bladder Tank 2	250
Hangar 365	Unknown	500
Hangar 365	Unknown	500
Hangar 553	Single Wall	800
Hangar 34	Single Wall	1,600
Hangar 323	Single Wall	5,000
Hangar 323	Single Wall	5,000
72	Atmospheric	30
72	Atmospheric	75
72	Atmospheric	75
71	Atmospheric	371
71	Atmospheric	190
71	Atmospheric	185
71	Atmospheric	20
71	Atmospheric	210
71	Atmospheric	185
70	Atmospheric	185

For TRI purposes, reportable uses of AFFF at NBVC Point Mugu are as follows:

- Emergency use in fire suppression
- Firefighting training activities
- Additions of AFFF to tanks/systems

In 2020, there were two reported events where AFFF was released at NBVC Point Mugu. Approximately 3 gal of AFFF were used in an unmanned aircraft crash, and 25 gal of AFFF were released because of a malfunction in a fire suppression system valve in Hangar 372.

There were no reported uses of AFFF for firefighting training in 2020.

Additionally, a large-scale effort to replace older AFFF products with a Military Specification (MILSPEC)-compliant AFFF in fire suppression systems has been in effect across Commander, Naval Region Southwest (CNRSW) installations, including NBVC Point Mugu. As a result, multiple systems/tanks equipped with AFFF containing PFAS chemicals at concentrations above 800 parts per billion (ppb) have been replaced with the MILSPEC-compliant AFFF.<sup>17</sup> The amounts of PFAS chemicals in the MILSPEC-compliant AFFF added to systems are counted toward the TRI reporting threshold in accordance with USEPA TRI reporting guidance relevant to closed systems. However, this effort was cancelled before being carried out at NBVC Point Mugu, and as a result there were no new additions of AFFF in 2020.

<sup>17</sup> Data provided by Christina Graulau, NAVFAC SW Environmental Compliance Core, to MMEC Group on February 4, 2021.

A total of 28 gal of AFFF were used in either in fire suppression efforts or as an accidental release at NBVC Point Mugu in 2020. Recent analytical data on the AFFF in Hangar 372 indicate that it contains perfluorooctane sulfonic acid (PFOS) at a concentration of 5,650,000 ppb. Applying this concentration to the quantity of AFFF released in 2020 yields:

- $28 \text{ gal AFFF} \times 3.78 \text{ liters per gallon (L/gal)} \times 5,650,000 \text{ micrograms per liter } (\mu\text{g/L}) \times 0.0022 \text{ lb/gram} \div 1,000,000 \text{ micrograms per gram } (\mu\text{g/g}) = 1.3 \text{ lb of PFOS}$

Additionally, the SDS for many AFFF products lists 2-(2-butoxyethoxy)ethanol (CAS No. 112-34-5) in the mixture at 10 to 30%. This chemical is included in the glycol ether TRI chemical category (N230) and its use must be considered toward the otherwise used threshold evaluation. Using the mid point of the chemical composition range, 20%, yields the following the quantity of 2-(2-butoxyethoxy)ethanol in 2020:

- $28 \text{ gal AFFF} \times 1.02 \times 8.34 \text{ lb/gal} \times 0.20 \text{ lb 2 (2 butoxyethoxy)ethanol / lb AFFF} = 48 \text{ lb 2-(2-butoxyethoxy)ethanol}$

Note that 1.02 is the specific gravity of typical AFFF products.

## 7.0 TRI OTHERWISE USED CHEMICAL THRESHOLD EVALUATION

Table 3 summarizes the TRI chemical usage from the various organizations and data sources addressed in Section 6.0. Based on these results, quantities of nitrate compounds (in the form of calcium nitrate), lead, and naphthalene exceeded a TRI reporting threshold in 2020 at NBVC Point Mugu, and thus Form Rs were required for these chemicals. Per Navy guidance, although the ranges are considered to be part of the main NBVC Point Mugu installation facility for TRI applicability and threshold determination, environmental releases and offsite transfers of TRI chemicals from range activities are to be reported on Form Rs that are separate from those of the main installation.

**Table 3. NBVC Point Mugu RY2020 TRI Chemical Threshold Evaluation Summary**

TRI Chemical	CAS #	HAZMIN Center (lb)	Other Hazmat Use (lb)	Fuel (lb)	Munitions (lb)	AFFF (lb)	Total (lb)
1,2,4-Trimethylbenzene	95-63-6	11	---	1,876	---	--	1,887
Aluminum (fume or dust)	7429-90-5	14	---	---	1	--	15
Barium Compounds	N040	27	---	---	5	--	32
Benzene	71-43-2	---	---	1,563	---	--	1,563
n-Butanol	71-36-3	7	---	---	---	--	7
Copper	7440-50-8	1	---	---	702	--	703
Dibutylphthalate		---	---	---	31	--	31
Diphenylamine	122-39-4	451	---	---	8	--	459
Ethylbenzene	100-41-4	21	---	8,645	---	--	8,666
Ethylene Glycol	107-21-1	5,656	---	---	---	--	5,656
Glycol Ethers	N230	140	---	---	---	48	188
n-Hexane	110-54-3	---	---	1,876	---	--	1,876
<b>Lead</b>	<b>7439-92-1</b>	<b>27.1</b>	---	---	<b>2,341.8</b>	--	<b>2,368.9</b>
Lead Compounds	N420	19.4	---	---	6.2	--	25.6
Manganese Compounds	N450	223	---	---	---	--	223
<b>Naphthalene</b>	<b>91-20-3</b>	---	---	<b>23,653</b>	---	--	<b>23,653</b>
<b>Nitrate Compounds</b>	<b>N511</b>	---	<b>306,926</b>	---	---	--	<b>306,926</b>
Nitroglycerin	55-63-0	---	---	---	75	--	75
Perfluorooctane sulfonic acid	1763-23-1	---	---	---	---	1.3	1.3
Phenol	108-95-2	54	---	---	---	--	54
Sulfuric Acid	7664-93-9	1	---	---	---	--	---
Toluene	108-88-3	265	---	4,689	---	--	4,954
Xylene (mixed isomers)	1330-20-7	56	---	4,689	---	--	4,745
Zinc Compounds	N982	149	---	---	---	--	149

Note: Chemicals in **bold** text were reportable chemicals for NBVC Point Mugu for RY2020.

CAS = Chemical Abstracts Service; HAZMIN = hazardous material minimization; lb=pound(s); TRI = toxic release inventory

## 8.0 TRI PROCESSED CHEMICAL THRESHOLD EVALUATION

As presented in Section 6.2.2, TRI chemicals in jet fuel issued to the FBI and USCG aircraft are considered processed. Approximately 2,960 lb of naphthalene and 978 lb of ethylbenzene in the jet fuel were issued to the FBI and USCG aircraft in 2020; these quantities are below the processed chemical threshold amount of 25,000 lb per year. However, the amount of naphthalene exceeded the otherwise used threshold, as indicated in Table 3; therefore, the amount of naphthalene considered processed will also be accounted for when calculating NBVC Point Mugu environmental releases and offsite transfers for RY2020.

Also, 598 lb of ethylene glycol were processed in antifreeze recycling activities performed by FRC in Building 311. This amount is well below the processed chemical threshold amount of 25,000 lb per year.

## 9.0 TRI MANUFACTURED CHEMICAL THRESHOLD EVALUATION

NBVC Point Mugu is not in the business of manufacturing chemicals; however, TRI chemicals may be manufactured as byproducts of fuel combustion from activities onsite. Navy TRI policy excludes byproducts emitted from motor vehicle tailpipes from inclusion in TRI manufactured chemical quantities; however, combustion byproducts from non-motor-vehicle sources are not excluded.

Tables 4 and 5 present the quantities of TRI chemicals manufactured at NBVC Point Mugu in 2020 from the burning of the following fuels:

- Natural gas = 46 million cubic feet (heating plant)
- Diesel fuel = 9,124 + 34,070 = 43,194 gal (from Sections 6.2.3)
- Gasoline = 312 gal (Section 6.2.1)
- JP-5 and JAA = 635 (JAA) + 14,513 (JAA) = 15,148 gal (Section 6.2.2)

Combustion byproduct chemical quantities manufactured were calculated from USEPA AP-42 emission factors.<sup>18</sup> No TRI chemical thresholds for manufactured chemicals were exceeded.

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<sup>18</sup> USEPA AP 42 Fifth edition, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Chapter 1: External Combustion Sources Section 1.4 Natural Gas, Chapter 3: Stationary Internal Combustion Sources Section 3.3 Gasoline and Diesel Industrial Engines.*

**Table 4. TRI Chemicals Manufactured from Natural Gas Combustion at NBVC Point Mugu (2020)**

CAS #	TRI Chemical	PBT	Emission Factor (lb/MMscf)	Decimal Equivalent (lb/MMscf)	2020 Natural Gas Use (MMscf/yr)	Chemical Emissions (lb/yr)	TRI Threshold Exceeded?
120-12-7	Anthracene	No	<2.4E-06	0.00000239	46	0.0	No
71-43-2	Benzene	No	2.10E-03	0.0021	46	0.1	No
25321-22-6	Dichlorobenzene	No	1.20E-03	0.0012	46	0.1	No
50-00-0	Formaldehyde	No	7.50E-02	0.075	46	3.5	No
<b>91-20-3</b>	<b>Naphthalene</b>	<b>No</b>	<b>6.10E-04</b>	<b>0.00061</b>	46	<b>0.0</b>	<b>No</b>
85-01-8	Phenanthrene	No	1.70E-05	0.000017	46	0.0	No
108-88-3	Toluene	No	3.40E-03	0.0034	46	0.2	No
7440-38-2	Arsenic	No	2.00E-04	0.0002	46	0.0	No
7440-39-3	Barium	No	4.40E-03	0.0044	46	0.2	No
7440-41-7	Beryllium	No	<1.2E-05	0.0000119	46	0.0	No
7440-43-9	Cadmium	No	1.10E-03	0.0011	46	0.1	No
7440-47-3	Chromium	No	1.40E-03	0.0014	46	0.1	No
7440-48-4	Cobalt	No	8.40E-05	0.000084	46	0.0	No
7440-50-8	Copper	No	8.50E-04	0.00085	46	0.0	No
7439-96-5	Manganese	No	3.80E-04	0.00038	46	0.0	No
7440-02-0	Nickel	No	2.10E-03	0.0021	46	0.1	No
7782-49-2	Selenium	No	<2.4E-05	0.000024	46	0.0	No
7440-62-2	Vanadium	No	2.30E-03	0.0023	46	0.1	No
<b>7439-92-1</b>	<b>Lead</b>	<b>Yes 100 lb</b>	<b>5.00E-04</b>	<b>0.0005</b>	<b>46</b>	<b>0.0</b>	<b>No</b>
7439-97-6	Mercury	Yes 10 lb/yr	2.60E-04	0.00026	46	0.0	No
191-24-2	Benzo[g,h,i,l]perylene	Yes 10 lb/yr	<1.2E-06	0.00000119	46	0.0	No
<i>Polycyclic Aromatic Compounds Category (100 lb/yr threshold)</i>							
56-49-5	3-Methylchloranthrene	PAC	<1.8E-06	0.00000179	46	0.0	No
57-97-6	7,12-Dimethylbenza(a)anthracene	PAC	<1.6E-05	0.000016	46	0.0	
56-55-3	Benz(a)anthracene	PAC	<1.8E-06	0.00000179	46	0.0	
50-32-8	Benzo(a)pyrene	PAC	<1.2E-06	0.00000119	46	0.0	
205-99-2	Benzo(b)fluoranthene	PAC	<1.8E-06	0.00000179	46	0.0	
205-82-3	Benzo(k)fluoranthene	PAC	<1.8E-06	0.00000179	46	0.0	
53-70-3	Dibenzo(a,h,)anthracene	PAC	<1.2E-06	0.00000119	46	0.0	
193-39-5	Indeno(1,2,3cd)pyrene	PAC	<1.8E-06	0.00000179	46	0.0	
PAC Total						0.0	

Note: Chemicals in **bold** text were reportable chemicals for NBVC Point Mugu for RY2020.

CAS = Chemical Abstracts Service; lb = pound(s); MMscf = million standard cubic feet; PAC = polycyclic aromatic compound; PBT = persistent bioaccumulative toxic; TRI = Toxic Release Inventory; yr = year

**Table 5. TRI Chemicals Manufactured from Non-motor-vehicle Diesel Fuel, Gasoline, and JP-5 Combustion at NBVC Point Mugu (2020)**

CAS #	TRI Chemical	PBT	Emission Factor (lb/MMBTU)	Decimal Equivalent (lb/MMBTU)	2020 Diesel and Gasoline Fuel Use (MMBTU/yr)	Chemical Emissions (lb/yr)	TRI Threshold Exceeded?
71-43-2	Benzene	No	9.33 E-04	0.000933	8,160	7.6	No
108-88-3	Toluene	No	4.09 E-04	0.000409	8,160	3.3	No
1330-20-7	Xylenes	No	2.85 E-04	0.000285	8,160	2.3	No
115-07-1	Propylene	No	2.58 E-03	0.00258	8,160	21.1	No
106-99-0	1,3-Butadiene	No	<3.91 E-05	0.00003909	8,160	0.3	No
50-00-0	Formaldehyde	No	1.18 E-03	0.00118	8,160	9.6	No
75-07-0	Acetaldehyde	No	7.67 E-04	0.000767	8,160	6.3	No
107-02-8	Acrolein	No	<9.25 E-05	0.00009249	8,160	0.8	No
<b>91-20-3</b>	<b>Naphthalene</b>	<b>No</b>	<b>8.48 E-05</b>	<b>0.0000848</b>	<b>8,160</b>	<b>0.7</b>	<b>No</b>
85-01-8	Phenanthrene	No	2.94 E-05	0.0000294	8,160	0.2	No
120-12-7	Anthracene	No	1.87 E-06	0.00000187	8,160	0.0	No
191-24-2	Benzo(g,h,i)perylene	Yes 10 lb/yr	<4.89 E-07	0.000000488	8,160	0.0	No
<i>Polycyclic Aromatic Compounds Category (100 lb/yr threshold)</i>							
56-55-3	Benz(a)anthracene	PAC	1.68E-06	0.00000168	8,160	0.0	No < 100 lb/yr
50-32-8	Benzo(a)pyrene	PAC	1.88E-07	0.000000188	8,160	0.0	
205-99-2	Benzo(b)fluoranthene	PAC	<9.91E-08	0.0000000991	8,160	0.0	
205-82-3	Benzo(k)fluoranthene	PAC	<1.55E-07	0.000000155	8,160	0.0	
53-70-3	Dibenzo(a,h)anthracene	PAC	<5.83E-07	0.000000583	8,160	0.0	
193-39-5	Indeno(1,2,3-cd)pyrene	PAC	<3.75E-07	0.000000375	8,160	0.0	
PAC Total						0.0	No < 100 lb/yr

Note: Chemicals in **bold** text were reportable chemicals for NBVC Point Mugu for RY2020.

CAS = Chemical Abstracts Service; lb = pound(s); MMBTU = million BTU (BTU – British Thermal Unit); PAC = polycyclic aromatic compound; PBT = persistent bioaccumulative toxic; TRI = Toxic Release Inventory; yr = year

Diesel fuel: 139,200 BTU/gal

Gasoline: 125,000 BTU/gal

JP-5: 139,200 BTU/gal

Total diesel fuel use in non-motor vehicles for 2020 = 43,194 gal

Total gasoline use in non-motor vehicles for 2020 = 312 gal

Total jet fuel use in non-motor vehicles for 2020 = 15,148 gal

$[(139,200 \text{ BTU/gal} \times 43,194 \text{ gal/yr}) + (125,000 \text{ BTU/gal} \times 312 \text{ gal/yr}) + (139,200 \text{ BTU/gal} \times 15,148 \text{ gal/yr})] \times 1 \text{ MMBTU}/1,000,000 \text{ BTU}$   
= 8,160 MMBTU/yr

## **10.0 FORM R CALCULATIONS – NAPHTHALENE**

### **10.1 Air Releases of Naphthalene from Non-exempt Fuel Use**

A total of 26,613 lb of naphthalene were processed (2,960 lb) or otherwise used (23,653 lb) in non-exempt jet fuel, diesel fuel, and gasoline activities. Most of the naphthalene in fuels is combusted. A small amount will evaporate to air from storage tanks and during fueling operations, and other small quantities will be lost from small spills and leaks. Approximately 88% of the 26,613 lb was from jet fuel use. Given that air releases of naphthalene from diesel fuel and gasoline will not be significantly different from releases from jet fuel on a per-gal basis, air releases of naphthalene from non-exempt fuel use were estimated below assuming that all 26,613 lb were in jet fuel.

Jet fuel at NBVC Point Mugu is received from the DFSP San Pedro via trucks, stored in large tanks at the NAVSUP FLC Fuels Division, transferred to fuel delivery trucks, and then transferred directly into aircraft or small local/satellite storage tanks. For non-exempt jet fuel, transfers are to transient aircraft, JETCs, USCG and FBI aircraft, and satellite storage tanks around NBVC Point Mugu. The following tanks are used at the NAVSUP FLC Fuels Division for storing JP-5 and JAA:

- 5 tanks, each with 26,000-gal capacity for JP-5
- 3 tanks, each with 106,000-gal capacity for JAA
- 3 tanks, each with 300,000-gal capacity for JAA

The five large tanks receive JP-5 and serve as day tanks and defuel tanks. The three 106,000 gal tanks receive JAA, and the three 300,000 gal tanks of JAA are for issues. According to NBVC Point Mugu Fuels Division data, 234,577 gal of JAA and 14,134 gal of JP-5 received in 2020 were used for non-exempt purposes, as presented in Section 6.2.2.

Naphthalene in JAA and JP-5 is released to air primarily during filling of the following:

- NAVSUP FLC Fuels Division storage tanks (via the DFSP delivery trucks)
- On-base fuel delivery trucks (via the storage tanks)
- Satellite fuel storage tanks around NBVC Point Mugu (via the on-base fuel delivery trucks)
- Aircraft fuel tanks

It is also released from leaks from pumps, valves, and fittings in piping used to transfer the fuel.

AP-42 Emission Factors were previously used to estimate the working and breathing losses based on the size and type of storage tanks. Air releases for 2020 were proportioned using the quantity of non-exempt fuel for the year to yield:

- Fugitive air emissions from non-exempt fuel use – 0.07 lb
- Stack air emissions from non-exempt fuel use – 4.6 lb

### **10.2 Naphthalene Released in Wastewater**

It is presumed that some naphthalene from reportable (non-exempt) sources will end up in the effluent from the wastewater treatment plant onsite. However, these reportable amounts would be small and unquantifiable relative to the amounts from exempt sources.

### 10.3 Naphthalene Sent Offsite in Absorbent, and Fuel Waste

Waste jet fuel and waste absorbents will contain a small quantity of naphthalene. Only naphthalene in waste generated from non-exempt activities must be addressed. Non-exempt activities generating the jet fuel wastes include the following:

- FLC Fuel Farm – assume 8% of this waste is non-exempt<sup>19</sup>
- FRC Support equipment maintenance –100% of this waste is non-exempt
- FRC Test cell –100% of this waste is non-exempt
- FRC Prop shop –100% of this waste is non-exempt
- FRC Air frames –100% of this waste is non-exempt

Waste data were reviewed to quantify offsite transfers of the fuel-contaminated waste from these organizations, and then to estimate the naphthalene content in the wastes.

NBVC Point Mugu data indicate that 1,574 lb of waste jet fuel (waste profile HW07) were generated by the FLC Fuel Farm and 612 lb by the FRC shops listed above. Most of the non-exempt jet fuel used in 2020 was JAA, which has a naphthalene content that straddles the de minimis limit (0 to 3%); therefore, the amount of naphthalene in non-exempt used jet fuel waste was estimated as follows:

- $[(1,574 \text{ lb} \times 0.08) + 374 \text{ lb JAA}] \times [(0.030 - 0.001) / (0.030 - 0.000)] \times [(0.030 + 0.001) / 2] = 7.5 \text{ lb naphthalene sent to Recicladora Temarry De Mexico}$

NBVC Point Mugu data indicate that 590 lb of used petroleum, oil, and lubricant (POL) absorbents (waste profile NR13) were generated by the FLC Fuel Farm and 2,627 lb FRC shops listed above. Assuming that 50% of the absorbent waste is POL and 100% of the POL is JAA, the amount of naphthalene in non-exempt absorbent waste is estimated as follows:

- $[(590 \text{ lb} \times 0.08) + 3,279 \text{ lb JAA}] \times 0.5 \times [(0.030 - 0.001) / (0.030 - 0.000)] \times [(0.030 + 0.001) / 2] = 25 \text{ lb naphthalene sent to U.S. Ecology in Beatty, Nevada}$

### 10.4 Naphthalene in Stormwater

Data from NBVC Point Mugu Environmental Program Office indicate that naphthalene is no longer analyzed in stormwater samples taken in 2020.<sup>20</sup> It is presumed that some naphthalene from reportable (non-exempt) sources will end up in the stormwater. However, these reportable amounts would be small and unquantifiable relative to the amounts from exempt sources.

### 10.5 Other Non-exempt Naphthalene

From Table 5, the amount of naphthalene from combustion byproducts is reported as 0.7 lb. There were no other non-exempt uses of naphthalene at NBVC Point Mugu in 2020.

### 10.6 Naphthalene Form R Summary

Naphthalene releases and offsite transfers estimated in Sections 10.1 through 10.5 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of naphthalene from NBVC Point Mugu.

*5.1 Releases to air (fugitive/non-point source) = 0.07 lb, which rounds to 0 lb*

*5.2 Releases to air (stack/point source) = 4.6 + 0.7 = 5.3 lb, which rounds to 5 lb*

*5.3.1 Releases to water = 0 lb*

<sup>19</sup> The quantity of all non-exempt fuel discussed in Section 6.2 was 8% of the total fuel distributed.

<sup>20</sup> Stormwater sampling data provided by Kevin Korstad, MMEC Group, to Natalie Baum, MMEC Group, June 23, 2021.

6.1 Transfers to POTW = 0 lb

6.2.1 Transfers to offsite locations – *Recicladora Temarry De Mexico* = used jet fuel = 7.5 lb, which rounds to 8 lb

6.2.2 Transfer to offsite locations – *U.S. Ecology* = absorbents = 25 lb

## 11.0 FORM R CALCULATIONS – NITRATE COMPOUNDS

Wastewater exiting NBVC Point Mugu at the Building 64 lift station is known to contain nitrate compounds that are added to control odor (specifically odors from hydrogen sulfide [ $\text{H}_2\text{S}$ ]) in the sanitary sewer discharging to the local POTW. A large quantity of nitrate compounds is added to the sewage in the form of Trioxyn® as discussed in Section 6.1.2. The nitrate compounds in the Trioxyn® react with  $\text{H}_2\text{S}$  and serve as an oxygen source for bacteria. Most of the nitrate compounds are consumed in this process.

In 2020, the average nitrate concentration at the NBVC Point Mugu sewage discharge point was 7 parts per million (ppm) (as nitrogen [N]).<sup>21</sup> Applying this value to the NBVC Point Mugu annual sewage discharge yields the quantity of nitrate compounds transferred to the POTW for 2020:<sup>22</sup>

- lb N = N concentration (milligrams per liter [mg/L]) x 3.78 L/gal x annual flow (gal) x 1 lb/453,600 mg
  - 7 mg/L x 3.78 L/gal x 90,435,700 gal x 1 lb/453,600 mg = 5,275 lb N
- lb nitrate compounds (as  $\text{NO}_3$ ) released = lb N x (62 lb  $\text{NO}_3$  / 14 lb N)
  - 5,275 lb N x (62/14) = 25,354, which rounds to 25,000 lb  $\text{NO}_3$  released to the POTW (Section 6.1 of Form R)

## 12.0 FORM R CALCULATIONS – LEAD

### 12.1 Lead at NBVC Point Mugu Ranges

TRI-DDS data were used to support the TRI release calculations for the NBVC Point Mugu Small Arms and Seabee Rifle Ranges. Based on munitions type and usage quantity, TRI-DDS calculates chemical-specific “air releases” and “non-air releases” for ranges using DoD-developed emission factors, mass balance assumptions, and munitions constituent data.

#### 12.1.1 Air Releases from the NBVC Point Mugu Ranges

Air releases of lead from the Seabee Rifle Range and the Small Bore Range were calculated to be 0 lb. The TRI-DDS air releases value is the amount of chemical expected to be released to air either as a point source (indoor range activity) or fugitive source (outside range activity). Because all activities at the Seabee Rifle Range and the Small Bore Range are performed outdoors, fugitive or non-point air releases were reported as 0 lb on the Form R. In accordance with the DoD TRI-DDS instructions, metal air release estimates were based on a mass balance approach, or Code C on the Form R.

#### 12.1.2 Non-Air Releases from the NBVC Point Mugu Ranges

Non-air releases of lead from the Seabee Rifle Range and the Small Bore Range were calculated by TRI-DDS to be 2,341.8 lb for RY2020. Lead releases to land, water, and/or transfers offsite were estimated using this quantity from TRI-DDS, augmented with user knowledge regarding the type of range, use of bullet traps, and range clearance activities performed during the reporting year.

<sup>21</sup> Data from 2020 NBVC Point Mugu Building 64 Chemical Treatment Product Use & Discharge Summary provided by Don Osborne of Consolidated Water Technologies, and were received by Clark Roberts of Downstream Services Corp.

<sup>22</sup> Data provided by Joshua Burton of NBVC Environmental Compliance, June 9, 2021.

Per Navy TRI guidance, if bullet traps are 100% efficient, releases to land are assumed to be zero and the amount recovered from the traps is deducted from the non-air releases quantity. If clearance activities are conducted, this information is used to estimate quantities of TRI chemicals transferred offsite and further deducted from the non-air releases quantity. If there are no other potential media streams for release (e.g., to water), the remainder of the non-air releases quantity would then be reported as released to land – other disposal (Section 5.5.4 of the Form R).

The two NBVC Point Mugu ranges use earthen berm backstops to capture rounds fired at targets.<sup>23</sup> Therefore, the lead released at these ranges was considered released to land (Section 5.5.4 of Form R). There were no range-clearance or berm-mining activities at these two ranges in 2020.<sup>24</sup> Therefore, the entire amount of lead non-air releases (2,341.8 lb) for these ranges was considered released to land, with no lead being transferred offsite for RY2020.

From the RY2019 report, it was estimated that no lead remained in the ranges at the end of 2019 because of the range clearance activities that took place during that year. With no clearance activities occurring in 2020, all of the lead non-air releases are assumed to remain in the ranges at the start of 2021 (a total of 2,341.8 lb) to be accounted for during the next range clearance effort.

### 12.1.3 Lead at NBVC Point Mugu Ranges Form R Summary

Lead releases and offsite transfers estimated in Section 12.1 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of lead from the NBVC Point Mugu ranges.

*5.1 Releases to air (fugitive/non-point source) = 0 lb*

*5.2 Releases to air (stack/point source) = not applicable*

*5.5.4 Releases to land = 2,341.8 lb*

### 12.2 Lead at the Remainder of NBVC Point Mugu

As shown in Table 1, use of lead at the remainder of NBVC Point Mugu was accounted for in one item:

- 27.1 lb of lead use in solder activities by FRC in Building 385, and Micro Electronics in Building 512.

Almost all of the lead in solder will remain on the electronics equipment undergoing maintenance, although a small quantity of lead may be released to the air. According to Betty Delk of Naval Air Warfare Center (NAWC) Instrumentation in Building 512, the wave soldering machine operates approximately 40 hours per year. There are no known lead soldering emission factors published by USEPA, and, with the relatively small amount of solder used, an estimated 0 lb of lead to air were released from this activity and reported on the Form R.

It is presumed that some lead from reportable (non-exempt) sources will end up in the stormwater that enters Mugu Lagoon from various outfalls aboard NBVC Point Mugu. However, these reportable amounts would be small and unquantifiable relative to the amounts from exempt sources.

<sup>23</sup> Earthen berms are not considered bullet traps, per the distinction drawn between the two on page 3 of *How to Consider Munitions and Range Activities under EPCRA Section 313*, March 2011. This is an addendum to the Navy's *Getting Started with The Emergency Planning and Community Right-to-Know Act (EPCRA)—A Basic Guidance Document for Navy Facilities*, May 2009.

<sup>24</sup> David Brown, David.brown.ca@navy.mil provided Small Bore Range data, March 9, 2021. GM1 James Carter, NCG-1, james.w.carter1@navy.mil, SeaBee Rifle Range, June 9, 2021.

Lead was assumed to be in the wastewater discharged to the City of Oxnard POTW. Analytical data for lead indicated a concentration of 0.0027 mg/L. Therefore, the amount of lead transferred to the POTW was estimated as follows:

- $0.0027 \text{ mg/L} \times 3.78 \text{ L/gal} \times 90,435,700 \text{ gal} \times 1 \text{ lb}/453,600 \text{ mg} = 2.0 \text{ lb lead}$

Lead-containing waste from non-exempt activities at the FRC was transferred offsite to U.S. Ecology. Because of the lack of analytical data on these waste streams, an estimated 100 ppm of lead were used to estimate the amount of lead transferred offsite from these non-exempt sources. Based upon waste codes from the waste profile spreadsheet, the following lead containing wastes from FRC were generated:

- $2,005 \text{ lb of plastic media from GSE maintenance B311} \times 0.0001 = 0.2 \text{ lb of lead}$

An estimated 0.2 lb of lead waste was shipped to U.S. Ecology and reported on the Form R.

### 12.3 Lead Form R Summary

Lead releases and offsite transfers estimated in Section 12.2 are summarized below by the Form R sections in which they must be reported. For example, Section 5.1 of the Form R contains the sum of all non-exempt, fugitive air releases of lead from NBVC Point Mugu.

*5.1 Releases to air (fugitive/non-point source) = not applicable*

*5.2 Releases to air (stack/point source) = 0 lb (Table 4)*

*5.3.1 Releases to water = 0 lb*

*6.1 Transfers to POTW = 2.0 lb*

*6.2.1 Transfers to offsite locations – US Ecology = 0.2 lb*

### 13.0 TRI FORM R REPORTS

NBVC Point Mugu was required to report under TRI for RY2020. Form R reports for TRI chemicals naphthalene, nitrate compounds, and lead were submitted to USEPA and the State of California by July 1, 2021. One Form R for lead was submitted for the NBVC Point Mugu ranges for RY2020.

### 14.0 KEY CHANGES FROM PRECEDING YEAR

There were no changes to reportable TRI chemicals at NBVC Point Mugu. Reportable quantities of naphthalene in RY2020 remain consistent with quantities reported in RY2019.

A decrease in nitrate concentration led to a decrease in nitrate compounds released to the POTW in 2020: 25,000 lb compared with 30,000 lb in 2019.

Overall, the amount of munitions fired at NBVC ranges in 2020 increased by 14% from 2019. A berm mining project in 2019 led to the recovery of 27,959 lb of lead in the ranges recycled offsite, which resulted in 0 lb of lead reported as released to land. There was no range lead collected or recycled offsite in 2020, resulting in 2,341.8 lb of lead reported as released to land.